

We claim:

1 A data retrieval system for causing a computer to retrieve data being stored in a database, said retrieval system comprising:

5 a database storing data as a vector digitized based on a keyword;

 a means for generating a residual vector from said data to compute a covariance matrix and an eigenvector of said covariance matrix, and for generating and storing a set of basic vectors from a set of said computed eigenvectors;

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 a means for reading out said data and at least one of said eigenvectors from a memory, and for computing a contribution of said eigenvector to said data, and for contracting or enlarging a residual vector to store; and

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 a means for selecting a keyword to be used for labeling according to a similarity between said stored basic vector and said data, and a weight on said similarity so as to store the keyword in a memory.

2 The data retrieval system according to claim 1, comprising a means for making said
20 basic vectors orthogonal.

3 The data retrieval system according to claim 1, wherein said means for selecting the
keyword to be used for labeling to store the keyword in the memory further comprises a
means for determining the weight on said similarity to said keyword and a means for
storing a certain number of keywords in a descending order in the memory in
5 connection with said weight.

4 A data retrieval method for causing a computer to retrieve data stored in a database,
said data retrieval method comprising the steps of:

10 reading out data from a database storing data as a vector digitized based on a
keyword;

 computing and storing a covariance matrix and an eigenvector of said covariance
matrix, using said data;

 generating and storing a set of basic vectors from a set of said computed
eigenvectors;

15 reading out said data and at least one of said eigenvectors from a memory, and
computing and storing a contribution of said eigenvector to said data; and

 computing a residual vector from said data and said eigenvector, and contracting or
enlarging a residual vector by reading out said contribution to compute and store a new
eigenvector.

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5 The data retrieval method according to claim 4, further comprising a step of selecting a

keyword to be used for labeling from a similarity between said stored basic vector and said data and a weight on said similarity to store the keyword in the memory.

6 The data retrieval method according to claim 5, wherein said step of selecting the

5 keyword to be used for labeling further comprises a step of determining the weight on said similarity to said keyword and storing a certain number of keywords in a descending order in the memory in connection with said weight.

7 A computer executable program for implementing a data retrieval method for causing a

10 computer to retrieve data stored in a database, said program comprising the steps of:

reading out data from a database storing data as a vector digitized based on a keyword;

15 computing and storing a covariance matrix and an eigenvector of said covariance matrix, using said data;

generating and storing a set of basic vectors from a set of said computed eigenvectors;

20 reading out said data and at least one of said eigenvectors from a memory, and computing and storing a contribution of said eigenvector to said data; and

computing a residual vector from said data and said eigenvector, and contracting or enlarging a residual vector by reading out said contribution to compute and store a new eigenvector.

5 8 The program according to claim 7, further comprising a step of selecting a keyword to be used for labeling from a similarity between said stored basic vector and said data and a weight on said similarity to store the keyword in the memory.

9 The program according to claim 7, further comprising a step of making said basic
10 vectors orthogonal before computing said residual vector.

10 A computer readable storage medium storing a computer executable program for implementing a data retrieval method for causing a computer to retrieve data stored in a database, said program comprising the steps of:

15 reading out data from a database storing data as a vector digitized based on a keyword;

20 computing and storing a covariance matrix and an eigenvector of said covariance matrix, using said data;

generating and storing a set of basic vectors from a set of said computed
eigenvectors;

reading out said data and at least one of said eigenvectors from a memory, and
computing and storing a contribution of said eigenvector to said data;

5 computing a residual vector from said data and said eigenvector, and contracting or
enlarging a residual vector by reading out said contribution to compute and store a new
eigenvector; and

generating and storing a set of basic vectors from a set of computed eigenvectors.

10 11 The storage medium according to claim 10, further comprising a step of selecting a
keyword to be used for labeling from a similarity between said stored basic vector and
said data and a weight on said similarity to store the keyword in the memory.

12 The storage medium according to claim 10, further comprising a step of making said
15 basic vectors orthogonal before computing said residual vector.

13 A graphical user interface system for displaying the computer retrieved data, said
graphical user interface system comprising:

a database storing data as a vector digitized based on a keyword;

20 a means for computing a basic vector from said data to store in a memory;

a means for classifying data into clusters depending on a similarity between said stored basic vector and said data, for counting the number of data included in said cluster, and for selecting a keyword to be used for labeling according to a weight on said similarity so as to store in a memory at least said number of data and said keyword as a pair; and

a means for displaying said cluster in spiral in order of the number of data of said cluster, and performing a different rendering processing for each adjacent cluster.

14 The graphical user interface system according to claim 13, wherein said means for
10 computing the basic vector comprises a means for reading out said data and at least one of said eigenvectors from a memory, and computing and storing a contribution of said eigenvector to said data.

15 The graphical user interface system according to claim 13, wherein said means for
15 displaying said cluster in spiral comprises a means for displaying the clusters from outside to inside in order of the clusters having a greater number of data.

16 A program for enabling a computer to implement a graphical user interface for displaying the computer retrieved data, said program comprising the steps of:

20 reading data from a database storing data as a vector digitized based on a keyword;

computing a basic vector from said data to store in a memory;

classifying data into clusters depending on a similarity between said stored basic vector and said data, for counting the number of data included in said cluster, and for selecting a keyword to be used for labeling according to a weight on said similarity so as to store in a memory at least said number of data and said keyword as a pair; and

displaying said cluster in spiral in order of the number of data of said cluster, and performing a different rendering processing for each adjacent cluster.

17 The program according to claim 16, wherein said step of computing the basic vector
10 comprises a step of reading out said data and at least one of said eigenvectors from the memory, and computing and storing a contribution of said eigenvector to said data.

18 The program according to claim 16, wherein said step of displaying said cluster in spiral
15 comprises a step of arranging the clusters from outside to inside in order of the clusters having a greater number of data.

19 A computer readable storage medium storing a program for enabling a computer to implement a graphical user interface for displaying the computer retrieved data, said program comprising the steps of:

20 reading data from a database storing data as a vector digitized based on a keyword;
computing a basic vector from said data to store in a memory;

classifying data into clusters depending on a similarity between said stored basic vector and said data, for counting the number of data included in said cluster, and for selecting a keyword to be used for labeling according to a weight on said similarity so as to store in a memory at least said number of data and said keyword as a pair; and displaying said cluster in spiral in order of the number of data of said cluster, and performing a different rendering processing for each adjacent cluster.

20 The storage medium according to claim 19, wherein said step of displaying said cluster
10 in spiral comprises a step of arranging the clusters from outside to inside in order of the clusters having a greater number of data.